

Compliance of Environmental Clearance conditions for the period 1st October 2021 to 31st March 2022

Project: Setting up a Grass Root 9 MMTPA Refinery cum Petrochemical Complex project at Tehsil Pachpadra, District Barmer (Rajasthan) by M/s Hindustan Petroleum Corporation Limited (HPCL)

Reference No.: F. No. J-11011/87/2013-IA-II(I) dated 13th September, 2017 and its amendment dated 31st January, 2020 by Ministry of Environment, Forests and Climate Change, GOI.

15. Compliance of terms and conditions (Specific Conditions)

(i)	Consent to Establish/Operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.	Complied. CTE obtained on 8 th Jan 2018 from RSPCB (order no: 2017-2018/HDF/2618).
(ii)	As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises. The effluent discharge, if any, shall conform to the standards prescribed under the Environment (Protection) Rules, 1986.	Zero Liquid Discharge for the refinery is ensured and no waste/treated water shall be discharged outside the premises. All effluent discharge shall conform to the standards prescribed under the Environment (Protection) Rules, 1986.
(iii)	Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.	Shall be complied with. This item has been addressed and included in item (i)-CTE issued from RSPCB.
(iv)	Environmental Standards for Petroleum Oil Refinery dated 18th March 2008 and Environmental Standards for Petrochemical (Basic and Intermediates) dated on 9 th November, 2012, and its amendments from time to time shall be followed.	Shall be complied with.
(v)	To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. Multi-cyclone followed by bag filter shall be provided to the DCU coke based CFBC boiler to control particulate emissions within permissible limit. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines.	Shall be complied with. Dust Extraction system is provided at outlet of Coke crusher within DCU and at bunker loading area of Captive Power Plant (CPP). All transfer point of conveyors are provided with dry fog type dust suppression system. Coke storage at coke yard is provided with Sprinkler Type dust suppression system. Adequate stack height is provided in all stacks as per CPCB/SPCB guidelines.

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(vi)	Total water requirement shall not exceed 5300 cum/hr to be met from Indira Gandhi Canal. Necessary permission in this regard shall be obtained from the concerned regulatory authority. No ground water shall be used without prior permission from the CGWA.	Noted. Permission for withdrawal of water from Indira Gandhi Nahar Pariyojana (IGNP) is in place. No ground water shall be used without prior permission from the Central Ground Water Authority (CGWA).
(vii)	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.	Shall be complied with.
(viii)	Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm, and solvent transfer to be done through pumps.	Shall be complied with.
(ix)	Process organic residue and spent carbon shall be sent to cement industries. ETP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF. The ash from boiler shall be sold to brick manufacturers/cement industry.	Shall be complied with. During operation of CPP, efforts will be made to sell the fly ash produced from CFBC boilers to brick manufacturers/cement industry as advised in the EC letter granted by MoEF&CC. ETP sludge will be routed to Delayed Coker Unit (DCU) for processing.
(x)	The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as amended time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.	Shall be complied with.
(xi)	Fly ash should be stored separately. as per CPCB guidelines so that it should not adversely affect the air quality, becoming air borne by wind or water regime during rainy season by flowing along with the storm water. Direct exposure of workers to fly ash & dust should be avoided.	Noted. Fly ash collected from different locations of the boiler (including ESP, APH) shall be conveyed to Reinforced Cement Concrete (RCC) silo through dense phase system (closed conveying). RCC sump to collect floor wash at different location of fly ash handling shall be provided. Separate silos shall be provided for fly ash and bed ash. There shall be one common RCC silo for fly ash collection from two Circulating Fluidized Bed Combustion (CFBC) boilers in each power block with capacity of 5 days of operation of both CFBC boilers at MCR. Ash from all silos shall be directly unloaded into container trucks in dry form through unloading spout. There shall be two such unloading spout in each silo so that unloading can be done through two trucks simultaneously. Provision shall also be made at each fly ash silo to moisture the ash and unload it in the open truck for further disposal outside the refinery complex.
(xii)	The company shall undertake waste minimization measures as below: - (a) Metering and control of quantities of active ingredients to minimize waste. (b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.	Noted. (a) – (e) Shall be complied with, as applicable. (f) Shall be complied with during the operation and maintenance phase of the project.

	<p>(c) Use of automated filling to minimize spillage.</p> <p>(d) Use of Close Feed system into batch reactors.</p> <p>(e) Venting equipment through vapour recovery system.</p> <p>(f) Use of high pressure hoses for equipment clearing to reduce wastewater generation.</p>	
(xiii)	<p>The green belt of at least 10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. As many as 25000 trees to be planted per year during first five years. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.</p>	<p>Noted.</p> <p>HRRL has acquired 4380.71 acres area from Government of Rajasthan. Total plot area of refinery and petrochemical (including Marketing Terminal) is 4126.95 acres. Total plot area of refinery and petrochemical (excluding Marketing Terminal) is 3876.95 acres. The allocated greenbelt of refinery area is 1279.38 acres and Marketing Terminal is 82.5 acres which is 33% of the total plot area within the Boundary line. Total greenbelt area of the refinery and marketing terminal is 1362 acres considering the total plot of 4126.9 acres. Green Belt will be developed in 33 % of the plot area within Boundary Line which is ~ 1362 Acre.</p> <p>Draft Greenbelt Development Plan was prepared and discussed with DFO, Barmer district for further execution. In this regard, Deputy Conservator of Forests, Barmer has advised to prepare a Detailed project report (DPR) with the assistance of reputed institutes like CAZRI, AFRI. As per Forest Department suggestion, Terms of Reference was prepared and submitted to AFRI, Jodhpur. The greenbelt plan was discussed with AFRI and TOR was finalized. A Feasibility Study will be carried out by AFRI and greenbelt plan to be suggested accordingly. Once the feasibility study is done, Forest Department will take-up plantation in the Refinery. The detailed greenbelt plan will be submitted to RO, MoEF&CC once the same is finalized by AFRI and Forest Deptt., Govt. of Rajasthan to execute the works under depository work.</p>
(xiv)	<p>All the commitment made regarding issues raised during the Public Hearing/ consultation meeting held on 30th May, 2014 shall be satisfactorily implemented.</p>	<p>Noted and will be implemented.</p>
(xv)	<p>At least 2.5% of the total project cost shall be allocated for Enterprise Social Commitment based on Public Hearing and item-wise details along with the time bound action plan shall be prepared and submitted to the Ministry's Regional Office.</p>	<p>MoEF&CC has accorded amendment in the EC vide letter no. F. No. J-11011/87/2013-IA-II(I) dated 31st January, 2020. The revised EC Condition is stated below:</p> <p>"At least Rs. 107.82 Crores (0.25% of the total project cost) shall be allocated for Corporate Environmental responsibility based on Public Hearing issues."</p>

		<p>CER proposals have been finalized in consultation with Government of Rajasthan (GOR):</p> <ul style="list-style-type: none">➤ Construction of alternate route from NH-025 km 92/800 to A/R Sajiyali Km 0/0 to 12/500 – Purchase Order for the construction of roads was placed on 24.12.2020. Work in progress.➤ Construction of BT road from NH-025 Km. 87/500 to A/R Sambhra Km 0/0 to 3/0. - Purchase Order for the construction of roads was placed on 24.12.2020. Completed.➤ Construction of Hospital - Topography survey completed. Engineering / tender development is in progress for site development and boundary wall.➤ Construction of School - Topography survey completed. Engineering / tender development is in progress for site development and boundary wall.➤ Vayujal Project (Atmospheric water generator)- In progress.➤ Covid-19 Kits for GOR- Completed➤ Construction of Oxygen plant building at GMCH, Barmer- Completed.➤ Avenue Plantation has been finalized in consultation with DC, Barmer as per the list given below: <table><tr><th>S No</th><th>Name of the Road</th></tr><tr><td>1</td><td>Pachpadra to Khed</td></tr><tr><td>2</td><td>National Highway to Akdali</td></tr><tr><td>3</td><td>Bagundi to Malwa</td></tr><tr><td>4</td><td>Pachpadra to Patodi</td></tr></table> <p>Total amount spend on ESR activities so far is Rs 454.9 (405.9 +49.0 (covid kit and Oxygen building)).</p>	S No	Name of the Road	1	Pachpadra to Khed	2	National Highway to Akdali	3	Bagundi to Malwa	4	Pachpadra to Patodi
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1	Pachpadra to Khed											
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(xvi)	For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.	Shall be complied with.										

(xvii)	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms.	Shall be complied with.
(xviii)	Continuous online (24x7) monitoring system. Both for emissions and the effluent shall be installed within the plant site for measurement of discharge and pollutants concentration. Data shall be uploaded on the company's website and provided to the respective RO's of MoEF&CC, CPCB and SPCB.	Shall be complied with.
(xix)	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Shall be complied with during the operation phase of the project.
(xx)	Wetland habitat shall be provided for migratory bird namely, Demoiselle crane, at the reservoir and green belt areas.	Shall be complied with. The Pachpadra lake is a rain water lake formed mostly during rainy seasons and it has created a natural wetland habitation which attracts migratory bird like Demoiselle cranes. This natural habitation is not affected and no impact on migratory birds has been noticed so far. Finalization of scope of work for study regarding the enhancement/ development of the wetland habitat is in progress.
(xxi)	At least 10 natural surface water bodies shall be rejuvenated and developed as complete eco-system with the tree plantation development and growth using satellite imageries.	Shall be complied with. The following water bodies (10 Nos) have been identified by DC Barmer for rejuvenation: Sarla Nada, Kasaiyon Ki Nadi, Kher ka Talav, Bhaibahan Ka Nada, Gulab Sagar, Tejori Nadi, Kola Nada, Khari Nadi, Ram Ghat Talav, Navoda Talav. Finalization of scope of work is in progress for carrying out the job.
(xxii)	The international boundary is reportedly at a distance of 100-150 km from the project site. In view of the security apprehensions, necessary permission required, if any, shall be obtained from the Ministry of Defense and/or Ministry of Home Affairs.	NOC has been issued by the IAF HQ SWAC vide letter SWAC/S2551/4/9/ATC dated 9th Aug 2018 and its amendment letter dated 27 th May 2019.
15.1	Compliance of other general conditions	
(i)	The project authorities must strictly adhere to the stipulations made by the State Government, Central Pollution Control Board, State Pollution Control Board and any other statutory authority.	Noted and shall be complied with. Stipulations of RSPCB vide CTE dated January 8, 2018 shall be complied with.
(ii)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from	Noted and shall be complied with.

	those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	
(iii)	The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one station each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.	The locations of ambient air quality monitoring stations have been decided in consultation with the Rajasthan State Pollution Control Board (RSPCB). Three (03) nos. of continuous ambient air quality monitoring stations will be installed. One no. station each will be installed in the upwind, downwind direction and where maximum ground level concentrations are anticipated.
(iv)	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16 th November, 2009 shall be followed.	Shall be complied with.
(v)	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall, conform to the standards prescribed. Under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	Necessary specification details shall be included in all the Engineering, Procurement & Construction (EPC) Contracts for implementation.
(vi)	The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and use the same water for the process activities of the project to conserve fresh water.	All water will be collected through storm water system for recharging the ground water.
(vii)	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	Shall be complied with. During the project phase, EPC Contractors are providing training to concerned workers and engineers who are involved in chemical handling. Pre-employment medical examination is being carried out for all workers and staff.
(viii)	The company shall also comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management and risk mitigation measures relating to the project shall be implemented.	Shall be complied with.
(ix)	The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villages and administration.	Shall be complied with.
(x)	The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.	Shall be complied with.
(xi)	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the	Fund provision has been envisaged for capital /recurring cost towards environment pollution control measures.

	Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/pollution control measures shall not be diverted for any other purpose.	
(xii)	A copy of clearance letter shall be sent by the project proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal.	Complied. EC letter sent to following agencies: BDO - Panchayat Samiti – Balotra, CEO, Zilla Parishad – Barmer, Sarpanch - Sambhra Village, Sarpanch - SRK Village, RSPCB RO-Jodhpur, vide our letter dated October 5 and 9, 2017.
(xiii)	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.	The compliance status is being submitted regularly on six monthly basis (April to September by 1st December and from October to March by 1st June) as per EIA Notification dated 14.09.2006 after grant of EC in Sept, 2017. The 8 th six monthly report for April 2021 to September 2021 was submitted in December 2021 to all statutory authorities and posted on HRRL website. The 9 th six monthly report for October 2021 to March 2022 is being submitted on June 01, 2022
(xiv)	The environmental statement for each financial year ending 31 st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.	Shall be complied. Form-V, Environmental statement shall be submitted to Rajasthan State Pollution Control Board after the Consent to Operate (CTO) is obtained before commissioning of the Project.
(xv)	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at http://moef.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	Complied. Environmental Clearance has been advertised on September 27, 2017 in Times of India (English) and Rajasthan Patrika (Hindi) Newspapers. A copy of the same has been sent to MoEF&CC Regional Office at Lucknow vide HPCL letter dated October 5, 2017.
(xvi)	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	Final approval of the project from MoPNG has been obtained on 9th October 2017. Financial closure was completed on 28 th January 2019. Detail Engineering Design of the process units is in progress.
16	The Ministry may revoke or suspend the clearance, at subsequent stages, if implementation of any of the above conditions is not satisfactory.	Noted

17	The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.	Noted
18	The above conditions will be enforced, inter alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention& Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	Noted

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Post Environmental Monitoring Report

For

**M/s HPCL Rajasthan Refinery Limited
(HRRL)**

At

Barmer, Rajasthan

Period : **October – December 2021**

Prepared by



Netel (India) Limited

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POST ENVIRONMENTAL DATA COLLECTION AT BARMER, RAJASTHAN

Name of Client M/s HPCL Rajasthan Refinery Limited (HRRL)
Tel Bhavan, Sahkar Marg Lal Kothi Vistar
Jyoti Nagar, Jaipur – 302 005
Rajasthan.

Project Management Consultant (PMC)
M/s. Engineers India Limited (EIL)
Sector-16 (on NH-8),
Gurugram, Haryana 122001

Name of Contractor NETEL (INDIA) LIMITED
Environment Management Services
W-408. Pipeline Road, MIDC Rabale
TTC Industrial Area, Navi Mumbai – 400 701

Work Order HRRL/LOA/2020/18, Dated 21.08.2020

Nature of Job Environmental Baseline Data Collection

 Prepared By Sr. Chemist	 Approved By Technical Manager	 Issued By Quality Manager
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1. AMBIENT AIR QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	Analysis Method	CPCB limit
1	Particulate Matter (PM ₁₀)	µg/m ³	IS 5182 (Part 23)	100
2	Particulate Matter (PM _{2.5})	µg/m ³	NIL/AIR/SOP/03*	60
3	Sulphur Dioxide (SO ₂)	µg/m ³	IS 5182 (Part 2)	80
4	Oxides of Nitrogen (NO _x)	µg/m ³	IS 5182 (Part 6)	80
5	Carbon Monoxide (CO)	mg/m ³	IS 5182 (Part 10)	2
6	Ozone (O ₃)	µg/m ³	IS 5182 (Part 9)	100
7	Benzene (C ₆ H ₆)	µg/m ³	IS 5182 (Part 11)	5

Note: * Laboratory SOP, based on CPCB Guidelines Volumes I & II

Results:

Sr. No.	Parameters	Unit	Richholi Village		
---	Date of Sampling	---	05.10.2021	19.10.2021	01.11.2021
---	Sample Code	---	NIL/OT/10/21/019	NIL/OT/10/21/099	NIL/OT/11/21/013
1	Particulate Matter (PM ₁₀)	µg/m ³	63.1	62.2	62.0
2	Particulate Matter (PM _{2.5})	µg/m ³	23.4	31.3	27.8
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.1	9.6	12.7
4	Oxides of Nitrogen (NO _x)	µg/m ³	15.5	12.9	16.0
5	Carbon Monoxide (CO)	mg/m ³	0.91	0.83	0.93
6	Ozone (O ₃)	µg/m ³	7.7	7.2	9.0
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	1.1

Sr. No.	Parameters	Unit	Richholi Village		
---	Date of Sampling	---	16.11.2021	01.12.2021	15.12.2021
---	Sample Code	---	NIL/OT/11/21/118	NIL/OT/12/21/287	NIL/OT/12/21/293
1	Particulate Matter (PM ₁₀)	µg/m ³	46.4	43.8	46.3
2	Particulate Matter (PM _{2.5})	µg/m ³	19.1	19.1	17.8
3	Sulphur Dioxide (SO ₂)	µg/m ³	10.6	9.8	9.5
4	Oxides of Nitrogen (NO _x)	µg/m ³	13.4	13.2	12.2
5	Carbon Monoxide (CO)	mg/m ³	0.58	0.70	0.66
6	Ozone (O ₃)	µg/m ³	5.1	10.0	9.6
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	<1.0

Results:

Sr. No.	Parameters	Unit	Kiyar Village		
---	Date of Sampling	---	07.10.2021	21.10.2021	01.11.2021
---	Sample Code	---	NIL/OT/10/21/020	NIL/OT/10/21/100	NIL/OT/11/21/014
1	Particulate Matter (PM ₁₀)	µg/m ³	49.8	55.6	54.6
2	Particulate Matter (PM _{2.5})	µg/m ³	17.4	24.3	20.4
3	Sulphur Dioxide (SO ₂)	µg/m ³	10.6	8.9	9.6
4	Oxides of Nitrogen (NO _x)	µg/m ³	13.7	12.1	12.1
5	Carbon Monoxide (CO)	mg/m ³	0.64	0.79	0.67
6	Ozone (O ₃)	µg/m ³	8.6	7.5	5.7
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.3	1.2

Sr. No.	Parameters	Unit	Kiyar Village		
---	Date of Sampling	---	18.11.2021	03.12.2021	17.12.2021
---	Sample Code	---	NIL/OT/11/21/119	NIL/OT/12/21/288	NIL/OT/12/21/294
1	Particulate Matter (PM ₁₀)	µg/m ³	34.0	34.9	37.1
2	Particulate Matter (PM _{2.5})	µg/m ³	14.8	16.9	15.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	6.7	6.1	7.9
4	Oxides of Nitrogen (NO _x)	µg/m ³	8.9	8.4	10.3
5	Carbon Monoxide (CO)	mg/m ³	0.54	0.59	0.55
6	Ozone (O ₃)	µg/m ³	7.0	8.3	7.7
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	<1.0

Results:

Sr. No.	Parameters	Unit	Sajiyali Village		
---	Date of Sampling	---	07.10.2021	21.10.2021	01.11.2021
---	Sample Code	---	NIL/OT/10/21/021	NIL/OT/10/21/101	NIL/OT/11/21/015
1	Particulate Matter (PM ₁₀)	µg/m ³	59.5	66.6	67.8
2	Particulate Matter (PM _{2.5})	µg/m ³	27.8	33.4	25.2
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.6	9.8	12.4
4	Oxides of Nitrogen (NO _x)	µg/m ³	15.7	12.3	16.7
5	Carbon Monoxide (CO)	mg/m ³	0.99	0.76	0.78
6	Ozone (O ₃)	µg/m ³	7.2	12.2	13.1
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.2	<1.0

Sr. No.	Parameters	Unit	Sajiyali Village		
---	Date of Sampling	---	18.11.2021	03.12.2021	17.12.2021
---	Sample Code	---	NIL/OT/11/21/120	NIL/OT/12/21/289	NIL/OT/12/21/295
1	Particulate Matter (PM ₁₀)	µg/m ³	43.5	41.4	46.8
2	Particulate Matter (PM _{2.5})	µg/m ³	15.2	17.4	19.5
3	Sulphur Dioxide (SO ₂)	µg/m ³	9.0	8.8	8.5
4	Oxides of Nitrogen (NO _x)	µg/m ³	11.3	11.1	11.6
5	Carbon Monoxide (CO)	mg/m ³	0.63	0.58	0.79
6	Ozone (O ₃)	µg/m ³	9.8	8.5	5.6
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	<1.0

Results:

Sr. No.	Parameters	Unit	Samra ki Dhani		
---	Date of Sampling	---	09.10.2021	23.10.2021	03.11.2021
---	Sample Code	---	NIL/OT/10/21/022	NIL/OT/10/21/102	NIL/OT/11/21/016
1	Particulate Matter (PM ₁₀)	µg/m ³	67.5	62.9	69.6
2	Particulate Matter (PM _{2.5})	µg/m ³	29.5	32.1	35.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	12.9	10.0	10.7
4	Oxides of Nitrogen (NO _x)	µg/m ³	16.5	13.5	13.6
5	Carbon Monoxide (CO)	mg/m ³	0.87	0.82	0.97
6	Ozone (O ₃)	µg/m ³	6.9	13.4	13.7
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.1	<1.0

Sr. No.	Parameters	Unit	Samra ki Dhani		
---	Date of Sampling	---	20.11.2021	05.12.2021	19.12.2021
---	Sample Code	---	NIL/OT/11/21/121	NIL/OT/12/21/290	NIL/OT/12/21/296
1	Particulate Matter (PM ₁₀)	µg/m ³	43.4	49.1	43.8
2	Particulate Matter (PM _{2.5})	µg/m ³	19.1	23.4	20.4
3	Sulphur Dioxide (SO ₂)	µg/m ³	8.1	9.3	9.2
4	Oxides of Nitrogen (NO _x)	µg/m ³	10.4	12.4	11.9
5	Carbon Monoxide (CO)	mg/m ³	0.69	0.61	0.74
6	Ozone (O ₃)	µg/m ³	10.7	5.2	6.8
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.3	<1.0

Results:

Sr. No.	Parameters	Unit	Kasajiyon Ki Dhani		
---	Date of Sampling	---	09.10.2021	23.10.2021	03.11.2021
---	Sample Code	---	NIL/OT/10/21/023	NIL/OT/10/21/103	NIL/OT/11/21/017
1	Particulate Matter (PM ₁₀)	µg/m ³	50.7	57.6	54.5
2	Particulate Matter (PM _{2.5})	µg/m ³	26.0	29.9	25.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	8.5	10.1	11.3
4	Oxides of Nitrogen (NO _x)	µg/m ³	11.6	13.5	15.4
5	Carbon Monoxide (CO)	mg/m ³	0.67	0.76	0.83
6	Ozone (O ₃)	µg/m ³	5.2	10.2	5.8
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	<1.0

Sr. No.	Parameters	Unit	Kasajiyon Ki Dhani		
---	Date of Sampling	---	20.11.2021	05.12.2021	19.12.2021
---	Sample Code	---	NIL/OT/11/21/122	NIL/OT/12/21/291	NIL/OT/12/21/297
1	Particulate Matter (PM ₁₀)	µg/m ³	37.9	35.9	37.7
2	Particulate Matter (PM _{2.5})	µg/m ³	16.5	13.9	18.2
3	Sulphur Dioxide (SO ₂)	µg/m ³	7.9	8.7	8.8
4	Oxides of Nitrogen (NO _x)	µg/m ³	10.3	11.1	11.5
5	Carbon Monoxide (CO)	mg/m ³	0.57	0.56	0.57
6	Ozone (O ₃)	µg/m ³	7.4	4.4	8.2
7	Benzene (C ₆ H ₆)	µg/m ³	1.3	1.1	<1.0

Results:

Sr. No.	Parameters	Unit	Pachpadra		
---	Date of Sampling	---	05.10.2021	19.10.2021	01.11.2021
---	Sample Code	---	NIL/OT/10/21/018	NIL/OT/10/21/098	NIL/OT/11/21/012
1	Particulate Matter (PM ₁₀)	µg/m ³	61.3	60.5	56.4
2	Particulate Matter (PM _{2.5})	µg/m ³	26.5	30.4	28.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.6	8.9	10.0
4	Oxides of Nitrogen (NO _x)	µg/m ³	15.2	11.5	13.0
5	Carbon Monoxide (CO)	mg/m ³	0.86	0.69	0.86
6	Ozone (O ₃)	µg/m ³	10.9	8.1	6.0
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.0	1.2

Sr. No.	Parameters	Unit	Pachpadra		
---	Date of Sampling	---	16.11.2021	01.12.2021	15.12.2021
---	Sample Code	---	NIL/OT/11/21/117	NIL/OT/12/21/286	NIL/OT/12/21/292
1	Particulate Matter (PM ₁₀)	µg/m ³	40.3	39.7	37.1
2	Particulate Matter (PM _{2.5})	µg/m ³	16.9	20.4	14.8
3	Sulphur Dioxide (SO ₂)	µg/m ³	7.6	9.1	8.3
4	Oxides of Nitrogen (NO _x)	µg/m ³	10.6	12.3	10.8
5	Carbon Monoxide (CO)	mg/m ³	0.70	0.54	0.55
6	Ozone (O ₃)	µg/m ³	9.1	6.8	9.1
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.2	<1.0

2. WATER QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	IS 10500 Limits (Desirable / Permissible)	Analysis Method
1	Temperature	°C	---	IS 3025 (Part 9)
2	Colour	Hazen	5 / 15	IS 3025 (Part 4)
3	Odour	—	Agreeable	IS 3025 (Part 5)
4	Taste	—	Agreeable	IS 3025 (Part 7 & 8)
5	pH	—	6.5 – 8.5	IS 3025 (Part 11)
6	Turbidity	NTU*	1 / 5	IS 3025 (Part 10)
7	Total Dissolved Solids	mg/lit	500 / 2000	IS 3025 (Part 16)
8	Total Suspended Solids	mg/lit	---	IS 3025 (Part 17)
9	Total Alkalinity	mg/lit	200 / 600	IS 3025 (Part 23)
10	Total Hardness	mg/lit	200 / 600	IS 3025 (Part 21)
11	Calcium Hardness	mg/lit	---	IS 3025 (Part 40)
12	Magnesium Hardness	mg/lit	---	IS 3025 (Part 21 & 40)
13	COD	mg/lit	---	IS 3025 (Part 58)
14	BOD	mg/lit	---	IS 3025 (Part 44)
15	Chloride	mg/lit	250 / 1000	APHA 4500-Cl
16	Salinity	ppt	---	IS 3025 (Part 32)
17	Sulphate	mg/lit	200 / 400	IS 3025 (Part 24)
18	Fluoride	mg/lit	1 / 1.5	IS 3025 (Part 60)
19	Nitrate	mg/lit	45	IS 3025 (Part 34)
20	Total Phosphorus	mg/lit	---	APHA 4500-P-C
21	Total Nitrogen	mg/lit	---	IS 3025 (Part 34)
22	Sodium	mg/lit	---	IS 3025 (Part 45)
23	Potassium	mg/lit	---	IS 3025 (Part 45)
24	Iron	mg/lit	0.3	APHA 3111-B
25	Manganese	mg/lit	0.1 / 0.3	APHA 3111-B
26	Cadmium	mg/lit	0.003	APHA 3111-B
27	Lead	mg/lit	0.01	APHA 3111-B
28	Zinc	mg/lit	5 / 15	APHA 3111-B
29	Nickel	mg/lit	0.02	APHA 3111-B
30	Copper	mg/lit	0.05 / 1.5	APHA 3111-B
31	Total Coliform	MPN/100ml	Absent	IS 1622 : 1981
32	Faecal Coliform	—	Absent	IS 1622 : 1981

Note: * Nephelometric Turbidity Unit

Results: Surface Water

Sr. No.	Parameters	Unit	Gulab Sagar Lake (S/W)		
			06.10.2021	02.11.2021	02.12.2021
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021
---	Sample Code	---	NIL/OT/10/21/016	NIL/OT/11/21/010	NIL/OT/12/21/280
1	Temperature	°C	25.1	26.4	25.4
2	Colour	Hazen	55	54	52
3	Odour	—	Agreeable	Agreeable	Agreeable
4	Taste	—	Agreeable	Agreeable	Agreeable
5	pH	—	7.81	8.12	8.04
6	Turbidity	NTU	28.2	30.2	32.4
7	Total Dissolved Solids	mg/lit	220.9	306.4	270.6
8	Total Suspended Solids	mg/lit	18	18	20
9	Total Alkalinity	mg/lit	81.5	78.2	92.9
10	Total Hardness	mg/lit	47.5	48.5	49.4
11	Calcium Hardness	mg/lit	31.8	30.8	28.6
12	Magnesium Hardness	mg/lit	12.3	13.2	11.3
13	COD	mg/lit	8	9	9
14	BOD	mg/lit	<5	<5	<5
15	Chloride	mg/lit	17.0	19.4	14.5
16	Salinity	ppt	0.06	0.06	0.06
17	Sulphate	mg/lit	2.8	3.0	2.9
18	Fluoride	mg/lit	0.3	0.3	0.3
19	Nitrate	mg/lit	<0.5	<0.5	<0.5
20	Total Phosphorus	mg/lit	1.1	1.1	1.3
21	Total Nitrogen	mg/lit	2.1	2.0	2.4
22	Sodium	mg/lit	15.2	16.4	15.2
23	Potassium	mg/lit	<0.05	<0.05	<0.05
24	Iron	mg/lit	0.63	0.52	0.68
25	Manganese	mg/lit	<0.1	<0.1	<0.1
26	Cadmium	mg/lit	<0.003	<0.003	<0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05
29	Nickel	mg/lit	<0.01	<0.01	<0.01
30	Copper	mg/lit	<0.04	<0.04	<0.04
31	Total Coliform	MPN/100ml	5	4	6
32	Faecal Coliform	—	Absent	Absent	Absent

Results: Surface Water

Sr. No.	Parameters	Unit	Kumbhariya Ka Talaw (S/W)		
			06.10.2021	02.11.2021	02.12.2021
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021
---	Sample Code	---	NIL/OT/10/21/017	NIL/OT/11/21/011	NIL/OT/12/21/281
1	Temperature	°C	25.6	25.3	22.5
2	Colour	Hazen	14	12	13
3	Odour	—	Agreeable	Agreeable	Agreeable
4	Taste	—	Agreeable	Agreeable	Agreeable
5	pH	—	8.00	7.84	7.76
6	Turbidity	NTU	5.8	6.1	6.0
7	Total Dissolved Solids	mg/lit	576.5	564.4	544.2
8	Total Suspended Solids	mg/lit	5	4	5
9	Total Alkalinity	mg/lit	66.7	70.0	74.0
10	Total Hardness	mg/lit	228.0	212.0	200.6
11	Calcium Hardness	mg/lit	124.4	105.7	129.4
12	Magnesium Hardness	mg/lit	136.0	137.4	141.4
13	COD	mg/lit	28	29	31
14	BOD	mg/lit	8	7	8
15	Chloride	mg/lit	142.5	152.5	152.5
16	Salinity	ppt	0.37	0.40	0.41
17	Sulphate	mg/lit	37.3	33.9	38.8
18	Fluoride	mg/lit	0.4	0.4	0.3
19	Nitrate	mg/lit	<0.5	<0.5	<0.5
20	Total Phosphorus	mg/lit	<1	<1	<1
21	Total Nitrogen	mg/lit	2.0	2.2	1.9
22	Sodium	mg/lit	6482	5963	6676
23	Potassium	mg/lit	1635	1373	1570
24	Iron	mg/lit	<0.1	<0.1	<0.1
25	Manganese	mg/lit	<0.1	<0.1	<0.1
26	Cadmium	mg/lit	<0.003	<0.003	<0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05
29	Nickel	mg/lit	<0.01	<0.01	<0.01
30	Copper	mg/lit	<0.04	<0.04	<0.04
31	Total Coliform	MPN/100ml	6	5	5
32	Faecal Coliform	—	Absent	Absent	Absent

Results: Ground Water

Sr. No.	Parameters	Unit	Akarli Village (G/W)			Limits*
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021	---
---	Sample Code	---	NIL/OT/10/21/012	NIL/OT/11/21/006	NIL/OT/12/21/276	---
1	Temperature	°C	26.5	23.9	26.0	---
2	Colour	Hazen	64	59	55	5 / 15
3	Odour	—	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	—	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	—	7.82	8.21	8.21	6.5 – 8.5
6	Turbidity	NTU	<1	<1	<1	1 / 5
7	Total Dissolved Solids	mg/lit	3145.4	3435.2	3246.9	500 / 2000
8	Total Suspended Solids	mg/lit	20	22	20	---
9	Total Alkalinity	mg/lit	633.9	633.9	564.2	200 / 600
10	Total Hardness	mg/lit	313.3	269.4	294.5	200 / 600
11	Calcium Hardness	mg/lit	188.0	161.7	193.6	---
12	Magnesium Hardness	mg/lit	109.4	97.4	121.4	---
13	COD	mg/lit	85	72	75	---
14	BOD	mg/lit	29	27	31	---
15	Chloride	mg/lit	3406.6	3270.3	3270.3	250 / 1000
16	Salinity	ppt	7.02	6.88	6.32	---
17	Sulphate	mg/lit	748.7	816.1	703.8	200 / 400
18	Fluoride	mg/lit	1.1	1.2	1.0	1 / 1.5
19	Nitrate	mg/lit	33.0	30.0	29.3	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	2481.2	2431.6	2431.6	---
22	Sodium	mg/lit	7641	7947	8940	---
23	Potassium	mg/lit	1400.0	1582	1666	---
24	Iron	mg/lit	<0.1	<0.1	<0.1	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	19	24	22	Absent
32	Faecal Coliform	—	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

Post Environmental Monitoring Report for HRRL, Rajasthan

Results: Ground Water

Sr. No.	Parameters	Unit	Meghwali Ki Dhani (G/W)			Limits*
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021	---
---	Sample Code	---	NIL/OT/10/21/013	NIL/OT/11/21/007	NIL/OT/12/21/277	---
1	Temperature	°C	24.9	26.1	28.4	---
2	Colour	Hazen	42	48	47	5 / 15
3	Odour	—	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	—	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	—	8.03	8.40	8.16	6.5 – 8.5
6	Turbidity	NTU	17.4	24.0	27.2	1 / 5
7	Total Dissolved Solids	mg/lit	3698.7	3354.7	3934.6	500 / 2000
8	Total Suspended Solids	mg/lit	820	763	910	---
9	Total Alkalinity	mg/lit	221.5	190.5	237.0	200 / 600
10	Total Hardness	mg/lit	277.1	315.9	252.2	200 / 600
11	Calcium Hardness	mg/lit	116.4	116.4	115.2	---
12	Magnesium Hardness	mg/lit	119.6	131.6	102.9	---
13	COD	mg/lit	161	140	180	---
14	BOD	mg/lit	51	52	47	---
15	Chloride	mg/lit	2447.4	2892.1	1981.1	250 / 1000
16	Salinity	ppt	8.10	7.86	7.05	---
17	Sulphate	mg/lit	343.4	315.9	329.7	200 / 400
18	Fluoride	mg/lit	4.9	5.3	4.5	1 / 1.5
19	Nitrate	mg/lit	<0.5	<0.5	<0.5	45
20	Total Phosphorus	mg/lit	2.6	2.4	3.0	---
21	Total Nitrogen	mg/lit	2.2	2.3	2.3	---
22	Sodium	mg/lit	526	486	551	---
23	Potassium	mg/lit	15.3	13.5	15.1	---
24	Iron	mg/lit	8.0	8.02	9.38	0.3
25	Manganese	mg/lit	0.2	0.2	0.2	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	0.4	0.5	0.2	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	9	10	9	Absent
32	Faecal Coliform	—	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

Post Environmental Monitoring Report for HRRL, Rajasthan

Results: Ground Water

Sr. No.	Parameters	Unit	Kiyar Village (G/W)			Limits*
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021	---
---	Sample Code	---	NIL/OT/10/21/014	NIL/OT/11/21/008	NIL/OT/12/21/278	---
1	Temperature	°C	25.5	25.0	27.3	---
2	Colour	Hazen	14	11	12	5 / 15
3	Odour	—	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	—	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	—	8.62	9.05	8.19	6.5 – 8.5
6	Turbidity	NTU	32.5	36.4	30.6	1 / 5
7	Total Dissolved Solids	mg/lit	3345.6	3178.7	2929.8	500 / 2000
8	Total Suspended Solids	mg/lit	16	15	17	---
9	Total Alkalinity	mg/lit	206.8	200.6	231.6	200 / 600
10	Total Hardness	mg/lit	368.6	357.5	342.8	200 / 600
11	Calcium Hardness	mg/lit	118.3	107.7	136.0	---
12	Magnesium Hardness	mg/lit	297.9	291.9	271.1	---
13	COD	mg/lit	129	112	134	---
14	BOD	mg/lit	46	49	52	---
15	Chloride	mg/lit	2923.2	2484.7	2484.7	250 / 1000
16	Salinity	ppt	5.66	5.94	6.23	---
17	Sulphate	mg/lit	701.7	778.9	750.8	200 / 400
18	Fluoride	mg/lit	0.2	0.2	0.2	1 / 1.5
19	Nitrate	mg/lit	<0.5	<0.5	<0.5	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	2.3	2.6	2.0	---
22	Sodium	mg/lit	603	768	733	---
23	Potassium	mg/lit	14.4	15.8	13.6	---
24	Iron	mg/lit	2.2	2.68	2.16	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	0.16	0.12	0.10	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent
32	Faecal Coliform	—	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

Post Environmental Monitoring Report for HRRL, Rajasthan

Results: Ground Water

Sr. No.	Parameters	Unit	Sajiyali Village (G/W)			Limits*
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021	---
---	Sample Code	---	NIL/OT/10/21/015	NIL/OT/11/21/009	NIL/OT/12/21/279	---
1	Temperature	°C	24.7	21.2	24.9	---
2	Colour	Hazen	66	69	63	5 / 15
3	Odour	—	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	—	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	—	8.12	8.07	8.17	6.5 – 8.5
6	Turbidity	NTU	<1	<1	<1	1 / 5
7	Total Dissolved Solids	mg/lit	15180.5	13510.6	15180.5	500 / 2000
8	Total Suspended Solids	mg/lit	10	9	9	---
9	Total Alkalinity	mg/lit	330.5	343.7	290.8	200 / 600
10	Total Hardness	mg/lit	183.0	155.6	201.3	200 / 600
11	Calcium Hardness	mg/lit	62.1	56.5	68.3	---
12	Magnesium Hardness	mg/lit	88.7	82.5	89.6	---
13	COD	mg/lit	85	93	76	---
14	BOD	mg/lit	32	29	27	---
15	Chloride	mg/lit	2146.1	1995.9	1953.0	250 / 1000
16	Salinity	ppt	9.44	8.50	10.86	---
17	Sulphate	mg/lit	575.1	609.6	609.6	200 / 400
18	Fluoride	mg/lit	5.8	6.4	6.0	1 / 1.5
19	Nitrate	mg/lit	0.5	0.5	0.5	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	2.2	2.0	2.1	---
22	Sodium	mg/lit	601	725	659	---
23	Potassium	mg/lit	14.1	14.4	12.7	---
24	Iron	mg/lit	<0.1	<0.1	<0.1	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	0.3	0.2	0.2	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent
32	Faecal Coliform	—	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

3. SOIL QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	Analysis Method
1	Particle Size Distribution		
	i. Sand	%	International Pipette Method
	ii. Silt	%	International Pipette Method
	iii Clay	%	International Pipette Method
2	Texture	–	International Pipette Method
3	pH Value	–	IS 2720 (Part 26)
4	Electrical Conductivity	mS/cm	IS 14767
5	Specific Gravity	mg/kg	ASTM D854
6	Bulk Density	g/cm ³	Note 1*
7	Organic Matter	%	Lab SOP No. NIL/SOP/05***
8	Sodium Absorption Ratio (SAR)	–	IS 11624
9	Porosity	%	Note 2**
10	NPK Value	mg/kg	APHA 4500-N-C and Lab SOP No. NIL/SOP/10***

Note :

1. * Environmental Analysis – Water, Soil and Air, by M.M. Saxena
2. ** Soil Sampling, Preparation and Analysis (2nd Edition) by Kim H. Tan
3. *** Based on Manual of Soil testing in India, Ministry of Agriculture, GOI, 2011

Results:

Sr. No.	Parameters	Unit	Near Project Site (Dewal Ki Dhani)		
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021
---	Sample Code	---	NIL/OT/10/21/008	NIL/OT/11/21/002	NIL/OT/12/21/282
1	Particle Size Distribution				
	i. Sand	%	98.4	99.0	98.8
	ii. Silt	%	0.5	0.8	0.6
	iii Clay	%	1.1	0.2	0.6
2	Texture	—	Sand	Sand	Sand
3	pH Value	—	8.19	8.35	7.86
4	Electrical Conductivity	mS/cm	2.684	2.257	2.159
5	Specific Gravity	mg/kg	2.34	2.20	3.11
6	Bulk Density	g/cm ³	1.99	1.83	1.68
7	Organic Matter	%	2.06	2.26	2.02
8	Sodium Absorption Ratio (SAR)	—	1.21	1.36	1.57
9	Porosity	%	21.7	17.7	21.2
10	NPK Value	mg/kg	323.5	348.5	365.2

Sr. No.	Parameters	Unit	Kasajiyon ki Dhani		
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021
---	Sample Code	---	NIL/OT/10/21/009	NIL/OT/11/21/003	NIL/OT/12/21/283
1	Particle Size Distribution				
	i. Sand	%	98.7	98.7	98.8
	ii. Silt	%	0.5	0.5	0.6
	iii Clay	%	0.8	0.8	0.6
2	Texture	—	Sand	Sand	Sand
3	pH Value	—	8.15	9.13	8.15
4	Electrical Conductivity	mS/cm	0.222	0.255	0.204
5	Specific Gravity	mg/kg	3.02	2.63	2.27
6	Bulk Density	g/cm ³	2.23	2.19	1.69
7	Organic Matter	%	1.52	1.56	1.39
8	Sodium Absorption Ratio (SAR)	—	2.88	2.19	2.07
9	Porosity	%	26.5	30.4	23.7
10	NPK Value	mg/kg	897.9	881.7	812.3

Result

LOCATION		Akarli					
DATE		19-10-2020	26-10-2020	06-11-2020	30-11-2021	03-12-2020	29-12-2020
Hourly L_{eq}	06:00 - 07:00	48.1	45.1	56.9	52.8	49.2	48.4
	07:00 - 08:00	51.2	39.9	58.0	46.4	49.5	45.5
	08:00 - 09:00	51.7	40.1	52.3	46.1	49.7	44.2
	09:00 - 10:00	53.4	50.0	53.7	51.0	51.4	46.5
	10:00 - 11:00	54.7	55.8	54.4	47.0	52.1	47.0
	11:00 - 12:00	53.6	49.4	55.8	47.5	51.0	46.2
	12:00 - 13:00	56.6	49.6	55.8	51.6	51.4	47.7
	13:00 - 14:00	55.4	43.0	49.1	45.5	47.2	43.0
	14:00 - 15:00	53.2	47.6	54.2	50.4	49.8	43.8
	15:00 - 16:00	53.4	48.4	54.3	50.5	51.1	47.2
	16:00 - 17:00	53.7	46.7	54.7	49.0	50.9	43.4
	17:00 - 18:00	54.0	47.5	53.7	49.5	51.4	44.9
	18:00 - 19:00	56.4	47.7	56.0	46.7	50.9	47.6
	19:00 - 20:00	55.1	45.8	52.0	47.4	49.2	47.3
	20:00 - 21:00	54.1	37.9	53.9	43.6	47.8	41.5
	21:00 - 22:00	52.8	40.7	51.3	44.5	50.8	46.1
	22:00 - 23:00	50.5	33.5	49.2	36.9	44.9	35.6
	23:00 - 00:00	46.7	48.2	44.6	38.6	44.4	36.6
	00:00 - 01:00	40.9	43.8	44.9	45.9	45.7	38.5
	01:00 - 02:00	40.2	41.1	40.9	47.0	45.6	42.6
	02:00 - 03:00	38.2	44.1	37.5	40.1	45.9	49.2
	03:00 - 04:00	38.4	40.6	37.2	40.8	44.4	49.2
	04:00 - 05:00	38.8	43.7	36.2	45.5	44.3	39.5
	05:00 - 06:00	42.6	45.6	49.0	48.5	44.5	41.3
L_{eq} Day		54.0	48.3	54.6	48.9	50.4	46.0
L_{eq} Night		44.4	44.0	44.9	44.6	45.0	44.4
L_{DN}		54.1	51.1	54.7	51.7	52.5	50.7

Note: All Values in dB(A)

Result

LOCATION		Dewal ki Dhani					
DATE		11-10-2021	25-10-2021	05-11-2021	22-11-2021	07-12-2021	21-12-2021
Hourly L_{eq}	06:00 - 07:00	52.9	51.3	48.0	45.1	48.1	52.0
	07:00 - 08:00	46.9	51.6	44.7	60.5	42.2	56.5
	08:00 - 09:00	47.7	51.6	40.9	38.3	38.6	57.0
	09:00 - 10:00	53.5	54.4	43.5	45.2	42.5	54.9
	10:00 - 11:00	49.6	54.6	57.4	41.8	46.8	56.9
	11:00 - 12:00	49.2	53.6	50.6	47.7	45.5	56.9
	12:00 - 13:00	53.5	54.9	47.2	46.8	44.8	56.4
	13:00 - 14:00	50.8	53.9	51.2	40.4	34.7	49.4
	14:00 - 15:00	49.2	54.2	60.7	38.1	42.5	51.6
	15:00 - 16:00	49.3	59.9	55.8	41.4	46.2	55.2
	16:00 - 17:00	49.1	60.2	47.6	43.6	45.2	56.6
	17:00 - 18:00	49.0	64.0	45.8	42.6	44.3	48.9
	18:00 - 19:00	48.9	62.7	36.4	42.1	44.1	51.8
	19:00 - 20:00	52.3	56.1	52.1	36.7	41.8	54.9
	20:00 - 21:00	49.5	58.9	48.4	37.7	38.6	49.2
	21:00 - 22:00	47.7	53.4	47.8	42.9	38.2	53.6
	22:00 - 23:00	42.9	47.3	44.1	40.0	34.4	51.1
	23:00 - 00:00	46.8	45.4	46.0	36.1	35.3	44.1
	00:00 - 01:00	38.5	40.4	45.1	41.1	39.8	47.1
	01:00 - 02:00	42.6	38.2	32.1	41.5	39.3	43.5
	02:00 - 03:00	37.6	32.4	44.9	29.1	35.0	42.0
	03:00 - 04:00	39.0	32.1	42.3	37.0	39.9	41.7
	04:00 - 05:00	44.5	34.5	41.3	38.7	36.6	42.6
	05:00 - 06:00	41.5	39.5	43.2	39.8	38.3	43.2
L_{eq} Day		50.4	57.9	52.6	49.5	43.9	54.7
L_{eq} Night		42.7	41.8	43.6	39.0	37.8	45.7
L_{DN}		51.3	56.6	53.0	49.3	45.6	55.1

Note: All Values in dB(A)

Result

LOCATION		Panch Padra					
DATE		07-10-2021	21-10-2021	03-11-2021	18-11-2021	03-12-2021	17-12-2021
Hourly L_{eq}	06:00 - 07:00	48.9	51.5	50.2	51.1	49.4	48.9
	07:00 - 08:00	47.4	49.2	56.9	49.4	48.9	50.1
	08:00 - 09:00	49.1	54.1	53.2	55.1	49.0	51.5
	09:00 - 10:00	55.0	52.3	55.5	51.9	49.5	53.7
	10:00 - 11:00	54.8	55.6	55.1	55.5	49.8	48.6
	11:00 - 12:00	58.6	54.4	55.5	54.4	49.7	47.7
	12:00 - 13:00	54.6	56.0	54.9	56.3	49.6	46.3
	13:00 - 14:00	59.5	50.5	54.9	51.3	48.7	45.9
	14:00 - 15:00	56.3	54.3	55.4	54.4	49.4	47.6
	15:00 - 16:00	56.9	53.4	56.7	53.1	49.2	47.9
	16:00 - 17:00	56.8	53.0	55.4	52.7	50.4	51.2
	17:00 - 18:00	58.0	53.5	54.6	53.4	50.2	53.5
	18:00 - 19:00	54.8	55.1	56.4	55.0	46.8	53.4
	19:00 - 20:00	55.4	53.1	52.9	52.9	47.8	51.3
	20:00 - 21:00	54.0	53.6	54.6	52.8	48.2	48.7
	21:00 - 22:00	53.2	51.6	53.6	51.9	49.0	52.8
	22:00 - 23:00	44.3	49.2	47.6	47.2	44.4	45.1
	23:00 - 00:00	41.8	46.4	44.9	46.7	43.8	44.4
	00:00 - 01:00	44.8	46.7	41.0	47.7	44.0	43.6
	01:00 - 02:00	41.3	42.7	40.1	43.5	43.7	45.2
	02:00 - 03:00	38.1	40.2	40.3	39.5	44.4	45.3
	03:00 - 04:00	38.6	43.6	43.9	42.7	44.1	43.2
	04:00 - 05:00	49.4	42.1	42.8	42.2	44.4	45.0
	05:00 - 06:00	47.6	41.3	44.8	41.2	45.2	45.1
L_{eq} Day		55.6	53.5	55.0	53.6	49.2	50.7
L_{eq} Night		44.8	45.0	43.9	44.7	44.3	44.7
L_{DN}		55.3	54.1	54.7	54.0	51.6	52.5

Note: All Values in dB(A)

Post Environmental Monitoring Report

For

**M/s HPCL Rajasthan Refinery Limited
(HRRL)**

At

Barmer, Rajasthan

Period : **January – March 2022**

Prepared by



Netel (India) Limited

W-408, MIDC Rabale, TTC Industrial Area

Navi Mumbai – 400 701, Maharashtra

Phone : 022 27606016

email : ems@netel-india.com



Post Environmental Monitoring Report for HRRL, Rajasthan

POST ENVIRONMENTAL DATA COLLECTION AT BARMER, RAJASTHAN

Name of Client M/s HPCL Rajasthan Refinery Limited (HRRL)
Tel Bhavan, Sahkar Marg Lal Kothi Vistar
Jyoti Nagar, Jaipur – 302 005
Rajasthan.

Project Management Consultant (PMC)
M/s. Engineers India Limited (EIL)
Sector-16 (on NH-8),
Gurugram, Haryana 122001

Name of Contractor NETEL (INDIA) LIMITED
Environment Management Services
W-408. Pipeline Road, MIDC Rabale
TTC Industrial Area, Navi Mumbai – 400 701

Work Order HRRL/LOA/2020/18, Dated 21.08.2020

Nature of Job Environmental Baseline Data Collection

 Prepared By Sr. Chemist	 Approved By Technical Manager	 Issued By Quality Manager
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1. AMBIENT AIR QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	Analysis Method	CPCB limit
1	Particulate Matter (PM ₁₀)	µg/m ³	IS 5182 (Part 23)	100
2	Particulate Matter (PM _{2.5})	µg/m ³	NIL/AIR/SOP/03*	60
3	Sulphur Dioxide (SO ₂)	µg/m ³	IS 5182 (Part 2)	80
4	Oxides of Nitrogen (NO _x)	µg/m ³	IS 5182 (Part 6)	80
5	Carbon Monoxide (CO)	mg/m ³	IS 5182 (Part 10)	2
6	Ozone (O ₃)	µg/m ³	IS 5182 (Part 9)	100
7	Benzene (C ₆ H ₆)	µg/m ³	IS 5182 (Part 11)	5

Note: * Laboratory SOP, based on CPCB Guidelines Volumes I & II

Results:

Sr. No.	Parameters	Unit	Richholi Village		
---	Date of Sampling	---	03.01.2022	17.01.2022	01.02.2022
---	Sample Code	---	NIL/OT/01/22/015	NIL/OT/01/22/145	NIL/OT/02/22/016
1	Particulate Matter (PM ₁₀)	µg/m ³	72.4	74.9	68.5
2	Particulate Matter (PM _{2.5})	µg/m ³	30.4	39.1	35.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	10.8	10.8	11.1
4	Oxides of Nitrogen (NO _x)	µg/m ³	14.0	14.4	15.3
5	Carbon Monoxide (CO)	mg/m ³	0.87	0.89	0.95
6	Ozone (O ₃)	µg/m ³	12.3	13.3	13.9
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.1	<1.0

Sr. No.	Parameters	Unit	Richholi Village		
---	Date of Sampling	---	15.02.2022	01.03.2022	23.03.2022
---	Sample Code	---	NIL/OT/02/22/160	NIL/OT/03/22/014	NIL/OT/03/22/196
1	Particulate Matter (PM ₁₀)	µg/m ³	69.0	74.2	68.9
2	Particulate Matter (PM _{2.5})	µg/m ³	33.0	29.1	36.0
3	Sulphur Dioxide (SO ₂)	µg/m ³	9.2	9.7	11.8
4	Oxides of Nitrogen (NO _x)	µg/m ³	12.8	13.0	15.9
5	Carbon Monoxide (CO)	mg/m ³	0.74	0.63	0.86
6	Ozone (O ₃)	µg/m ³	10.2	6.2	9.6
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	<1.0

Results:

Sr. No.	Parameters	Unit	Kiyar Village		
---	Date of Sampling	---	05.01.2022	19.01.2022	03.02.2022
---	Sample Code	---	NIL/OT/01/22/016	NIL/OT/01/22/146	NIL/OT/02/22/017
1	Particulate Matter (PM ₁₀)	µg/m ³	57.6	60.8	61.8
2	Particulate Matter (PM _{2.5})	µg/m ³	26.5	28.6	22.1
3	Sulphur Dioxide (SO ₂)	µg/m ³	9.8	8.9	11.4
4	Oxides of Nitrogen (NO _x)	µg/m ³	13.4	12.2	14.5
5	Carbon Monoxide (CO)	mg/m ³	0.84	0.81	0.85
6	Ozone (O ₃)	µg/m ³	6.7	12.1	9.6
7	Benzene (C ₆ H ₆)	µg/m ³	1.9	1.3	1.0

Sr. No.	Parameters	Unit	Kiyar Village		
---	Date of Sampling	---	17.02.2022	03.03.2022	25.03.2022
---	Sample Code	---	NIL/OT/02/22/161	NIL/OT/03/22/015	NIL/OT/03/22/197
1	Particulate Matter (PM ₁₀)	µg/m ³	61.8	59.9	61.4
2	Particulate Matter (PM _{2.5})	µg/m ³	26.5	26.9	22.1
3	Sulphur Dioxide (SO ₂)	µg/m ³	9.0	7.4	8.7
4	Oxides of Nitrogen (NO _x)	µg/m ³	11.6	9.4	12.1
5	Carbon Monoxide (CO)	mg/m ³	0.67	0.53	0.60
6	Ozone (O ₃)	µg/m ³	4.9	7.6	9.7
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.3	<1.0

Results:

Sr. No.	Parameters	Unit	Sajiyali Village		
---	Date of Sampling	---	05.01.2022	19.01.2022	03.02.2022
---	Sample Code	---	NIL/OT/01/22/017	NIL/OT/01/22/147	NIL/OT/02/22/018
1	Particulate Matter (PM ₁₀)	µg/m ³	70.9	71.2	78.7
2	Particulate Matter (PM _{2.5})	µg/m ³	35.6	31.3	31.7
3	Sulphur Dioxide (SO ₂)	µg/m ³	14.9	13.1	11.6
4	Oxides of Nitrogen (NO _x)	µg/m ³	19.7	18.3	14.5
5	Carbon Monoxide (CO)	mg/m ³	0.84	0.83	0.93
6	Ozone (O ₃)	µg/m ³	10.6	7.4	7.4
7	Benzene (C ₆ H ₆)	µg/m ³	3.0	2.6	3.0

Sr. No.	Parameters	Unit	Sajiyali Village		
---	Date of Sampling	---	17.02.2022	03.03.2022	25.03.2022
---	Sample Code	---	NIL/OT/02/22/162	NIL/OT/03/22/016	NIL/OT/03/22/198
1	Particulate Matter (PM ₁₀)	µg/m ³	72.0	78.6	70.6
2	Particulate Matter (PM _{2.5})	µg/m ³	37.3	38.6	26.9
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.0	10.3	12.0
4	Oxides of Nitrogen (NO _x)	µg/m ³	15.0	13.9	16.2
5	Carbon Monoxide (CO)	mg/m ³	0.72	0.91	0.74
6	Ozone (O ₃)	µg/m ³	10.7	9.6	11.3
7	Benzene (C ₆ H ₆)	µg/m ³	1.3	<1.0	1.3

Results:

Sr. No.	Parameters	Unit	Samra ki Dhani		
---	Date of Sampling	---	07.01.2022	21.01.2022	05.02.2022
---	Sample Code	---	NIL/OT/01/22/018	NIL/OT/01/22/148	NIL/OT/02/22/019
1	Particulate Matter (PM ₁₀)	µg/m ³	69.1	71.6	69.4
2	Particulate Matter (PM _{2.5})	µg/m ³	24.7	33.0	26.5
3	Sulphur Dioxide (SO ₂)	µg/m ³	13.1	11.4	15.5
4	Oxides of Nitrogen (NO _x)	µg/m ³	17.4	14.9	20.5
5	Carbon Monoxide (CO)	mg/m ³	0.86	0.92	1.01
6	Ozone (O ₃)	µg/m ³	7.8	9.2	8.6
7	Benzene (C ₆ H ₆)	µg/m ³	1.6	1.7	1.9

Sr. No.	Parameters	Unit	Samra ki Dhani		
---	Date of Sampling	---	19.02.2022	05.03.2022	27.03.2022
---	Sample Code	---	NIL/OT/02/22/163	NIL/OT/03/22/017	NIL/OT/03/22/199
1	Particulate Matter (PM ₁₀)	µg/m ³	78.1	68.8	76.9
2	Particulate Matter (PM _{2.5})	µg/m ³	41.2	33.0	33.9
3	Sulphur Dioxide (SO ₂)	µg/m ³	10.2	10.3	10.4
4	Oxides of Nitrogen (NO _x)	µg/m ³	14.2	13.8	13.6
5	Carbon Monoxide (CO)	mg/m ³	0.79	0.66	0.83
6	Ozone (O ₃)	µg/m ³	7.3	8.3	11.1
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.3	<1.0

Results:

Sr. No.	Parameters	Unit	Kasajiyon Ki Dhani		
---	Date of Sampling	---	07.01.2022	21.01.2022	05.02.2022
---	Sample Code	---	NIL/OT/01/22/019	NIL/OT/01/22/149	NIL/OT/02/22/020
1	Particulate Matter (PM ₁₀)	µg/m ³	59.3	57.4	62.0
2	Particulate Matter (PM _{2.5})	µg/m ³	29.5	24.3	31.7
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.1	9.7	9.9
4	Oxides of Nitrogen (NO _x)	µg/m ³	14.9	12.5	13.0
5	Carbon Monoxide (CO)	mg/m ³	0.69	0.80	0.85
6	Ozone (O ₃)	µg/m ³	10.6	9.0	12.3
7	Benzene (C ₆ H ₆)	µg/m ³	2.4	2.4	1.3

Sr. No.	Parameters	Unit	Kasajiyon Ki Dhani		
---	Date of Sampling	---	19.02.2022	05.03.2022	27.03.2022
---	Sample Code	---	NIL/OT/02/22/164	NIL/OT/03/22/018	NIL/OT/03/22/200
1	Particulate Matter (PM ₁₀)	µg/m ³	64.5	61.9	60.6
2	Particulate Matter (PM _{2.5})	µg/m ³	32.1	26.0	26.5
3	Sulphur Dioxide (SO ₂)	µg/m ³	7.8	8.2	8.2
4	Oxides of Nitrogen (NO _x)	µg/m ³	9.8	11.0	10.8
5	Carbon Monoxide (CO)	mg/m ³	0.62	0.74	0.74
6	Ozone (O ₃)	µg/m ³	7.0	8.5	9.6
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	1.3

Results:

Sr. No.	Parameters	Unit	Pachpadra		
---	Date of Sampling	---	03.01.2022	17.01.2022	01.02.2022
---	Sample Code	---	NIL/OT/01/22/014	NIL/OT/01/22/144	NIL/OT/02/22/015
1	Particulate Matter (PM ₁₀)	µg/m ³	62.2	67.2	62.1
2	Particulate Matter (PM _{2.5})	µg/m ³	26.0	24.7	30.4
3	Sulphur Dioxide (SO ₂)	µg/m ³	12.6	12.9	10.0
4	Oxides of Nitrogen (NO _x)	µg/m ³	16.5	17.0	12.5
5	Carbon Monoxide (CO)	mg/m ³	0.81	0.83	0.89
6	Ozone (O ₃)	µg/m ³	8.8	9.6	9.0
7	Benzene (C ₆ H ₆)	µg/m ³	2.8	1.3	1.3

Sr. No.	Parameters	Unit	Pachpadra		
---	Date of Sampling	---	15.02.2022	01.03.2022	23.03.2022
---	Sample Code	---	NIL/OT/02/22/159	NIL/OT/03/22/013	NIL/OT/03/22/195
1	Particulate Matter (PM ₁₀)	µg/m ³	66.0	70.7	70.5
2	Particulate Matter (PM _{2.5})	µg/m ³	25.2	36.9	38.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	9.0	9.8	9.3
4	Oxides of Nitrogen (NO _x)	µg/m ³	12.5	13.6	12.7
5	Carbon Monoxide (CO)	mg/m ³	0.66	0.77	0.63
6	Ozone (O ₃)	µg/m ³	6.6	9.6	9.6
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	1.1

2. WATER QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	IS 10500 Limits (Desirable / Permissible)	Analysis Method
1	Temperature	°C	---	IS 3025 (Part 9)
2	Colour	Hazen	5 / 15	IS 3025 (Part 4)
3	Odour	–	Agreeable	IS 3025 (Part 5)
4	Taste	–	Agreeable	IS 3025 (Part 7 & 8)
5	pH	–	6.5 – 8.5	IS 3025 (Part 11)
6	Turbidity	NTU*	1 / 5	IS 3025 (Part 10)
7	Total Dissolved Solids	mg/lit	500 / 2000	IS 3025 (Part 16)
8	Total Suspended Solids	mg/lit	---	IS 3025 (Part 17)
9	Total Alkalinity	mg/lit	200 / 600	IS 3025 (Part 23)
10	Total Hardness	mg/lit	200 / 600	IS 3025 (Part 21)
11	Calcium Hardness	mg/lit	---	IS 3025 (Part 40)
12	Magnesium Hardness	mg/lit	---	IS 3025 (Part 21 & 40)
13	COD	mg/lit	---	IS 3025 (Part 58)
14	BOD	mg/lit	---	IS 3025 (Part 44)
15	Chloride	mg/lit	250 / 1000	APHA 4500-Cl
16	Salinity	ppt	---	IS 3025 (Part 32)
17	Sulphate	mg/lit	200 / 400	IS 3025 (Part 24)
18	Fluoride	mg/lit	1 / 1.5	IS 3025 (Part 60)
19	Nitrate	mg/lit	45	IS 3025 (Part 34)
20	Total Phosphorus	mg/lit	---	APHA 4500-P-C
21	Total Nitrogen	mg/lit	---	IS 3025 (Part 34)
22	Sodium	mg/lit	---	IS 3025 (Part 45)
23	Potassium	mg/lit	---	IS 3025 (Part 45)
24	Iron	mg/lit	0.3	APHA 3111-B
25	Manganese	mg/lit	0.1 / 0.3	APHA 3111-B
26	Cadmium	mg/lit	0.003	APHA 3111-B
27	Lead	mg/lit	0.01	APHA 3111-B
28	Zinc	mg/lit	5 / 15	APHA 3111-B
29	Nickel	mg/lit	0.02	APHA 3111-B
30	Copper	mg/lit	0.05 / 1.5	APHA 3111-B
31	Total Coliform	MPN/100ml	Absent	IS 1622 : 1981
32	Faecal Coliform	–	Absent	IS 1622 : 1981

Note: * Nephelometric Turbidity Unit

Results: Surface Water

Sr. No.	Parameters	Unit	Gulab Sagar Lake (S/W)		
---	Date of Sampling	---	04.01.2022	02.02.2022	02.03.2022
---	Sample Code	---	NIL/OT/01/22/008	NIL/OT/02/22/009	NIL/OT/03/22/007
1	Temperature	°C	21.5	22.2	24.8
2	Colour	Hazen	50	45	40
3	Odour	–	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable
5	pH	–	7.57	7.89	7.95
6	Turbidity	NTU	11.5	12.0	12.5
7	Total Dissolved Solids	mg/lit	268	264	285
8	Total Suspended Solids	mg/lit	38	42	35
9	Total Alkalinity	mg/lit	84.0	88.0	90.0
10	Total Hardness	mg/lit	53.5	55.4	59.4
11	Calcium Hardness	mg/lit	39.6	41.6	43.6
12	Magnesium Hardness	mg/lit	13.9	13.9	15.8
13	COD	mg/lit	8	8	12
14	BOD	mg/lit	<5	<5	<5
15	Chloride	mg/lit	19.9	20.9	20.9
16	Salinity	ppt	0.066	0.068	0.068
17	Sulphate	mg/lit	2.5	2.8	3.2
18	Fluoride	mg/lit	0.26	0.22	0.30
19	Nitrate	mg/lit	<0.5	<0.5	<0.5
20	Total Phosphorus	mg/lit	1.2	0.98	0.95
21	Total Nitrogen	mg/lit	2.4	2.0	2.5
22	Sodium	mg/lit	14.5	13.6	14.8
23	Potassium	mg/lit	<0.05	<0.05	<0.05
24	Iron	mg/lit	0.64	0.60	0.68
25	Manganese	mg/lit	<0.1	<0.1	<0.1
26	Cadmium	mg/lit	<0.003	<0.003	<0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05
29	Nickel	mg/lit	<0.01	<0.01	<0.01
30	Copper	mg/lit	<0.04	<0.04	<0.04
31	Total Coliform	MPN/100ml	94	120	110
32	Faecal Coliform	–	Absent	Absent	Absent

Results: Surface Water

Sr. No.	Parameters	Unit	Kumbhariya Ka Talaw (S/W)		
---	Date of Sampling	---	04.01.2022	02.02.2022	02.03.2022
---	Sample Code	---	NIL/OT/01/22/009	NIL/OT/02/22/010	NIL/OT/03/22/008
1	Temperature	°C	22.2	22.8	24.6
2	Colour	Hazen	18	16	13
3	Odour	–	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable
5	pH	–	8.39	8.00	8.15
6	Turbidity	NTU	6.6	6.0	6.4
7	Total Dissolved Solids	mg/lit	664	644	672
8	Total Suspended Solids	mg/lit	8	6	10
9	Total Alkalinity	mg/lit	56.0	60.0	62.0
10	Total Hardness	mg/lit	217.8	219.8	221.8
11	Calcium Hardness	mg/lit	168.3	172.3	176.2
12	Magnesium Hardness	mg/lit	49.5	47.5	45.5
13	COD	mg/lit	24	28	32
14	BOD	mg/lit	7.2	8.6	7.6
15	Chloride	mg/lit	134.96	135.96	133.96
16	Salinity	ppt	0.27	0.27	0.27
17	Sulphate	mg/lit	36.6	38.5	30.2
18	Fluoride	mg/lit	0.45	0.52	0.46
19	Nitrate	mg/lit	<0.5	<0.5	<0.5
20	Total Phosphorus	mg/lit	<1	<1	<1
21	Total Nitrogen	mg/lit	2.4	2.0	2.5
22	Sodium	mg/lit	385	356	342
23	Potassium	mg/lit	125	129	131
24	Iron	mg/lit	<0.1	<0.1	<0.1
25	Manganese	mg/lit	<0.1	<0.1	<0.1
26	Cadmium	mg/lit	<0.003	<0.003	<0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05
29	Nickel	mg/lit	<0.01	<0.01	<0.01
30	Copper	mg/lit	<0.04	<0.04	<0.04
31	Total Coliform	MPN/100ml	94	120	84
32	Faecal Coliform	–	Absent	Absent	Absent

Results: Ground Water

Sr. No.	Parameters	Unit	Akarli Village (G/W)			Limits*
---	Date of Sampling	---	04.01.2022	02.02.2022	02.03.2022	---
---	Sample Code	---	NIL/OT/01/22/004	NIL/OT/02/22/005	NIL/OT/03/22/003	---
1	Temperature	°C	22.8	24.4	24.8	---
2	Colour	Hazen	58	60	64	5 / 15
3	Odour	–	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	–	8.36	8.24	8.28	6.5 – 8.5
6	Turbidity	NTU	<1	<1	<1	1 / 5
7	Total Dissolved Solids	mg/lit	3725	3522	3436	500 / 2000
8	Total Suspended Solids	mg/lit	12	18	20	---
9	Total Alkalinity	mg/lit	270.0	290.0	284.0	200 / 600
10	Total Hardness	mg/lit	312.8	308.9	314.8	200 / 600
11	Calcium Hardness	mg/lit	207.9	205.9	213.8	---
12	Magnesium Hardness	mg/lit	104.9	103.0	101.0	---
13	COD	mg/lit	28	32	32	---
14	BOD	mg/lit	<5	<5	<5	---
15	Chloride	mg/lit	1109.6	1079.6	1099.6	250 / 1000
16	Salinity	ppt	2.03	1.98	2.02	---
17	Sulphate	mg/lit	390.2	385.5	375.5	200 / 400
18	Fluoride	mg/lit	1.0	0.95	0.85	1 / 1.5
19	Nitrate	mg/lit	28.2	29.4	30.6	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	120.5	125.6	118.8	---
22	Sodium	mg/lit	5156	5262	5320	---
23	Potassium	mg/lit	1126	1028	1086	---
24	Iron	mg/lit	<0.1	<0.1	<0.1	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	17	13	14	Absent
32	Faecal Coliform	–	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

Results: Ground Water

Sr. No.	Parameters	Unit	Meghwali Ki Dhani (G/W)			Limits*
---	Date of Sampling	---	04.01.2022	02.02.2022	02.03.2022	---
---	Sample Code	---	NIL/OT/01/22/005	NIL/OT/02/22/006	NIL/OT/03/22/004	---
1	Temperature	°C	21.5	23.5	24.4	---
2	Colour	Hazen	35	32	30	5 / 15
3	Odour	–	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	–	7.53	7.75	7.62	6.5 – 8.5
6	Turbidity	NTU	12.2	10.5	10.5	1 / 5
7	Total Dissolved Solids	mg/lit	3696	3441	3515	500 / 2000
8	Total Suspended Solids	mg/lit	12	10	14	---
9	Total Alkalinity	mg/lit	200.0	202.0	204.0	200 / 600
10	Total Hardness	mg/lit	267.3	269.3	265.3	200 / 600
11	Calcium Hardness	mg/lit	194.0	196.0	188.1	---
12	Magnesium Hardness	mg/lit	73.3	73.3	77.2	---
13	COD	mg/lit	24	24	20	---
14	BOD	mg/lit	<5.0	<5.0	<5.0	---
15	Chloride	mg/lit	4434.8	4385.5	4484.1	250 / 1000
16	Salinity	ppt	8.03	7.95	8.12	---
17	Sulphate	mg/lit	285.5	278.6	284.0	200 / 400
18	Fluoride	mg/lit	4.6	5.0	5.2	1 / 1.5
19	Nitrate	mg/lit	<0.5	<0.5	<0.5	45
20	Total Phosphorus	mg/lit	2.0	2.6	2.2	---
21	Total Nitrogen	mg/lit	2.2	2.2	2.2	---
22	Sodium	mg/lit	6425	6286	6284	---
23	Potassium	mg/lit	58.2	60.6	65.5	---
24	Iron	mg/lit	7.60	7.68	7.44	0.3
25	Manganese	mg/lit	0.24	0.23	0.22	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	0.40	0.42	0.44	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	12	14	20	Absent
32	Faecal Coliform	–	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

Results: Ground Water

Sr. No.	Parameters	Unit	Kiyar Village (G/W)			Limits*
---	Date of Sampling	---	04.01.2022	02.02.2022	02.03.2022	---
---	Sample Code	---	NIL/OT/01/22/006	NIL/OT/02/22/007	NIL/OT/03/22/005	---
1	Temperature	°C	24.8	26.2	26.3	---
2	Colour	Hazen	12	13	12	5 / 15
3	Odour	–	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	–	8.19	7.46	7.54	6.5 – 8.5
6	Turbidity	NTU	30.7	34.6	34.2	1 / 5
7	Total Dissolved Solids	mg/lit	3652	3812	3536	500 / 2000
8	Total Suspended Solids	mg/lit	18	12	16	---
9	Total Alkalinity	mg/lit	124.0	128.0	128.0	200 / 600
10	Total Hardness	mg/lit	396.0	376.2	346.5	200 / 600
11	Calcium Hardness	mg/lit	227.7	217.8	198.0	---
12	Magnesium Hardness	mg/lit	168.3	158.4	148.5	---
13	COD	mg/lit	40	40	44	---
14	BOD	mg/lit	<5	<5	<5	---
15	Chloride	mg/lit	2513.0	2365.2	2414.5	250 / 1000
16	Salinity	ppt	4.57	4.30	4.39	---
17	Sulphate	mg/lit	637.0	735.0	693.0	200 / 400
18	Fluoride	mg/lit	0.2	0.2	0.2	1 / 1.5
19	Nitrate	mg/lit	<0.5	<0.5	<0.5	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	2.4	2.3	2.2	---
22	Sodium	mg/lit	4852.0	4622.0	4824.0	---
23	Potassium	mg/lit	52.8	56.6	60.2	---
24	Iron	mg/lit	2.04	2.08	2.16	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	0.14	0.14	0.12	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	24	21	25	Absent
32	Faecal Coliform	–	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

Results: Ground Water

Sr. No.	Parameters	Unit	Sajiyali Village (G/W)			Limits*
---	Date of Sampling	---	04.01.2022	02.02.2022	02.03.2022	---
---	Sample Code	---	NIL/OT/01/22/007	NIL/OT/02/22/008	NIL/OT/03/22/006	---
1	Temperature	°C	26.4	26.4	26.7	---
2	Colour	Hazen	76	65	70	5 / 15
3	Odour	–	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	–	8.18	8.22	8.15	6.5 – 8.5
6	Turbidity	NTU	<1	<1	<1	1 / 5
7	Total Dissolved Solids	mg/lit	3076	2774	2882	500 / 2000
8	Total Suspended Solids	mg/lit	13	14	13	---
9	Total Alkalinity	mg/lit	240.0	236.0	244.0	200 / 600
10	Total Hardness	mg/lit	178.2	168.3	188.1	200 / 600
11	Calcium Hardness	mg/lit	99.0	108.9	108.9	---
12	Magnesium Hardness	mg/lit	78.2	59.4	79.2	---
13	COD	mg/lit	40	48	48	---
14	BOD	mg/lit	<5.0	<5.0	<5.0	---
15	Chloride	mg/lit	1872.5	1773.9	1823.2	250 / 1000
16	Salinity	ppt	3.41	3.23	3.32	---
17	Sulphate	mg/lit	587.1	518.7	541.5	200 / 400
18	Fluoride	mg/lit	5.4	4.9	5.5	1 / 1.5
19	Nitrate	mg/lit	0.5	0.5	0.5	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	2.0	1.8	2.0	---
22	Sodium	mg/lit	669.5	617.5	598.0	---
23	Potassium	mg/lit	54.2	48.8	52.3	---
24	Iron	mg/lit	<0.1	<0.1	<0.1	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	0.26	0.24	0.22	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	31	25	17	Absent
32	Faecal Coliform	–	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

3. SOIL QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	Analysis Method
1	Particle Size Distribution		
	i. Sand	%	International Pipette Method
	ii. Silt	%	International Pipette Method
	iii Clay	%	International Pipette Method
2	Texture	–	International Pipette Method
3	pH Value	–	IS 2720 (Part 26)
4	Electrical Conductivity	mS/cm	IS 14767
5	Specific Gravity	mg/kg	ASTM D854
6	Bulk Density	g/cm ³	Note 1*
7	Organic Matter	%	Lab SOP No. NIL/SOP/05***
8	Sodium Absorption Ratio (SAR)	–	IS 11624
9	Porosity	%	Note 2**
10	NPK Value	mg/kg	APHA 4500-N-C and Lab SOP No. NIL/SOP/10***

Note :

1. * Environmental Analysis – Water, Soil and Air, by M.M. Saxena
2. ** Soil Sampling, Preparation and Analysis (2nd Edition) by Kim H. Tan
3. *** Based on Manual of Soil testing in India, Ministry of Agriculture, GOI, 2011

Results:

Sr. No.	Parameters	Unit	Near Project Site (Dewal Ki Dhani)		
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021
---	Sample Code	---	NIL/OT/10/21/008	NIL/OT/11/21/002	NIL/OT/12/21/282
1	Particle Size Distribution				
	i. Sand	%	98.8	99.2	99.2
	ii. Silt	%	0.9	0.5	0.7
	iii Clay	%	0.3	0.3	0.1
2	Texture	—	Sand	Sand	Sand
3	pH Value	—	8.35	8.11	8.19
4	Electrical Conductivity	mS/cm	2.733	2.462	2.314
5	Specific Gravity	mg/kg	2.85	2.57	2.65
6	Bulk Density	g/cm ³	2.25	2.05	2.05
7	Organic Matter	%	2.28	1.92	2.30
8	Sodium Absorption Ratio (SAR)	—	1.40	1.36	1.18
9	Porosity	%	21.9	20.9	21.5
10	NPK Value	mg/kg	308.0	320.2	341.3

Sr. No.	Parameters	Unit	Kasajiyon ki Dhani		
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021
---	Sample Code	---	NIL/OT/10/21/009	NIL/OT/11/21/003	NIL/OT/12/21/283
1	Particle Size Distribution				
	i. Sand	%	98.6	98.3	98.8
	ii. Silt	%	1.1	1.0	0.8
	iii Clay	%	0.3	0.7	0.4
2	Texture	—	Sand	Sand	Sand
3	pH Value	—	8.24	8.75	8.15
4	Electrical Conductivity	mS/cm	0.218	0.222	0.206
5	Specific Gravity	mg/kg	2.79	2.79	2.31
6	Bulk Density	g/cm ³	2.09	2.13	1.75
7	Organic Matter	%	1.59	1.48	1.52
8	Sodium Absorption Ratio (SAR)	—	2.80	2.36	2.46
9	Porosity	%	24.5	26.5	25.2
10	NPK Value	mg/kg	433.7	426.0	480.1

Results:

Sr. No.	Parameters	Unit	Sajiyali Village		
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021
---	Sample Code	---	NIL/OT/10/21/010	NIL/OT/11/21/004	NIL/OT/12/21/284
1	Particle Size Distribution				
	i. Sand	%	98.7	98.3	98.8
	ii. Silt	%	0.6	1.2	0.8
	iii Clay	%	0.7	0.5	0.4
2	Texture	—	Sand	Sand	Sand
3	pH Value	—	8.59	8.25	8.67
4	Electrical Conductivity	mS/cm	0.116	0.118	0.128
5	Specific Gravity	mg/kg	2.08	2.04	2.37
6	Bulk Density	g/cm ³	1.76	1.82	1.91
7	Organic Matter	%	0.97	0.72	0.85
8	Sodium Absorption Ratio (SAR)	—	6.50	6.42	7.52
9	Porosity	%	16.7	15.6	15.9
10	NPK Value	mg/kg	345.6	303.8	285.0

Sr. No.	Parameters	Unit	Godaro Ki Dhani		
---	Date of Sampling	---	06.10.2021	02.11.2021	02.12.2021
---	Sample Code	---	NIL/OT/10/21/011	NIL/OT/11/21/005	NIL/OT/12/21/285
1	Particle Size Distribution				
	i. Sand	%	99.0	99.5	99.5
	ii. Silt	%	0.9	0.4	0.4
	iii Clay	%	0.1	0.1	0.1
2	Texture	—	Sand	Sand	Sand
3	pH Value	—	8.25	8.42	8.08
4	Electrical Conductivity	mS/cm	0.099	0.104	0.088
5	Specific Gravity	mg/kg	2.60	2.60	2.93
6	Bulk Density	g/cm ³	1.73	2.00	1.87
7	Organic Matter	%	0.57	0.64	0.59
8	Sodium Absorption Ratio (SAR)	—	6.36	6.85	6.54
9	Porosity	%	22.6	23.5	23.3
10	NPK Value	mg/kg	406.7	329.0	312.9

4. NOISE LEVEL MONITORING

Standard:

As per the Noise Pollution (Regulation and Control) Rules, 2000 the Ambient Air Quality Standards in respect of Noise are as below:

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence Zone	50	40

- Note:-**
1. Day time mean from 6.00 a.m. to 10.00 p.m.
 2. Night time mean from 10.00 p.m. to 6.00 a.m.
 3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
 4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Result:

LOCATION		Kiyar					
DATE		04.01.2022	18.01.2022	08.02.2022	16.02.2022	02.03.2022	24.03.2022
Hourly L_{eq}	06:00 - 07:00	43.6	51.4	48.5	47.3	48.3	47.6
	07:00 - 08:00	50.0	47.8	51.5	47.1	47.2	51.4
	08:00 - 09:00	51.5	50.4	50.8	49.6	47.6	45.8
	09:00 - 10:00	46.8	50.8	49.9	51.1	38.5	49.3
	10:00 - 11:00	47.6	51.8	48.2	53.6	54.2	46.7
	11:00 - 12:00	46.3	52.6	46.6	49.1	53.6	41.8
	12:00 - 13:00	43.4	48.9	39.2	45.7	54.1	47.2
	13:00 - 14:00	47.1	48.2	49.2	48.0	51.5	48.8
	14:00 - 15:00	46.5	51.0	48.8	51.9	53.4	49.1
	15:00 - 16:00	37.2	50.7	47.4	44.2	53.1	43.9
	16:00 - 17:00	43.3	52.8	47.1	48.7	46.1	56.4
	17:00 - 18:00	36.5	49.8	45.6	48.9	42.7	48.2
	18:00 - 19:00	44.4	50.1	44.4	48.9	42.3	51.0
	19:00 - 20:00	47.1	47.8	49.3	47.9	46.1	47.2
	20:00 - 21:00	48.9	47.9	50.9	55.6	50.2	48.4
	21:00 - 22:00	46.6	48.5	49.6	53.6	51.4	49.0
	22:00 - 23:00	43.6	45.8	45.7	44.9	48.4	46.7
	23:00 - 00:00	42.3	42.2	42.6	43.1	41.9	43.1
	00:00 - 01:00	42.3	43.5	42.5	41.3	44.6	43.2
	01:00 - 02:00	42.3	41.1	42.8	45.0	42.4	42.8
	02:00 - 03:00	40.3	42.7	44.1	40.9	39.3	41.0
	03:00 - 04:00	40.3	40.4	43.4	44.8	40.3	40.3
	04:00 - 05:00	42.2	43.0	43.2	43.3	43.7	45.3
	05:00 - 06:00	44.0	44.7	42.7	43.4	46.1	44.1
L_{eq} Day		46.8	50.3	48.7	50.5	50.6	49.6
L_{eq} Night		42.3	43.2	43.5	43.6	44.3	43.8
L_{DN}		49.5	51.5	50.9	51.8	52.2	51.5

Note: All Values in dB(A)

Result

LOCATION		Akarli					
DATE		03.01.2022	17.01.2022	01.02.2022	15.02.2022	01.03.2022	23.03.2022
Hourly L_{eq}	06:00 - 07:00	48.2	50.9	30.3	47.9	47.9	49.6
	07:00 - 08:00	47.4	47.8	37.9	50.3	46.2	51.3
	08:00 - 09:00	47.4	47.3	52.7	50.2	49.1	49.3
	09:00 - 10:00	45.5	55.4	44.6	51.5	47.7	53.1
	10:00 - 11:00	47.1	49.1	43.6	54.7	43.9	53.5
	11:00 - 12:00	40.5	50.1	35.3	54.2	44.2	51.6
	12:00 - 13:00	48.6	49.8	37.3	53.0	48.8	51.6
	13:00 - 14:00	43.1	48.5	50.2	52.9	50.7	53.9
	14:00 - 15:00	46.2	52.4	38.0	53.1	50.1	52.8
	15:00 - 16:00	48.5	50.7	39.5	53.6	46.4	52.7
	16:00 - 17:00	45.9	51.3	41.2	52.3	47.7	55.2
	17:00 - 18:00	48.4	56.4	44.7	52.2	48.9	56.7
	18:00 - 19:00	50.1	56.0	46.6	52.9	47.0	53.4
	19:00 - 20:00	40.8	50.4	46.1	52.5	48.8	50.6
	20:00 - 21:00	42.8	49.6	45.6	48.8	51.1	48.7
	21:00 - 22:00	43.6	48.9	48.8	50.6	43.9	48.6
	22:00 - 23:00	45.1	44.1	44.5	44.4	45.2	45.5
	23:00 - 00:00	42.5	42.5	44.1	44.6	41.7	45.0
	00:00 - 01:00	42.0	43.2	42.4	42.0	44.5	42.4
	01:00 - 02:00	44.7	42.9	44.2	42.7	41.2	42.6
	02:00 - 03:00	47.8	39.8	44.7	43.2	40.5	39.7
	03:00 - 04:00	44.3	44.1	44.2	41.3	45.2	43.3
	04:00 - 05:00	43.6	42.9	43.0	42.2	42.8	41.6
	05:00 - 06:00	41.9	44.1	43.7	42.4	44.5	41.5
L_{eq} Day		46.7	51.9	45.8	52.3	48.2	52.6
L_{eq} Night		44.4	43.1	43.9	43.0	43.5	43.1
L_{DN}		50.9	52.3	50.3	52.5	50.7	52.8

Note: All Values in dB(A)

Result

LOCATION		Dewal ki Dhani					
DATE		05.01.2022	19.01.2022	03.02.2022	17.02.2022	03.03.2022	25.03.2022
Hourly L_{eq}	06:00 - 07:00	48.4	49.7	49.8	49.6	47.0	46.6
	07:00 - 08:00	49.9	55.8	50.3	48.3	50.1	41.4
	08:00 - 09:00	52.7	50.1	48.1	47.4	48.4	49.9
	09:00 - 10:00	47.1	46.2	51.8	51.8	50.6	47.2
	10:00 - 11:00	50.6	51.5	49.8	52.0	55.6	46.5
	11:00 - 12:00	52.0	50.8	53.9	53.8	50.9	43.1
	12:00 - 13:00	48.9	49.2	53.5	53.3	53.4	50.4
	13:00 - 14:00	46.4	48.1	59.2	49.5	48.8	50.5
	14:00 - 15:00	51.1	49.3	31.5	53.3	52.5	51.3
	15:00 - 16:00	52.1	48.5	49.6	51.8	53.4	44.2
	16:00 - 17:00	51.8	51.0	52.9	52.5	51.6	49.0
	17:00 - 18:00	52.8	40.9	56.5	52.7	51.9	52.3
	18:00 - 19:00	51.2	45.2	51.5	51.4	55.3	51.4
	19:00 - 20:00	48.6	45.5	49.8	51.6	53.3	48.5
	20:00 - 21:00	51.0	48.0	48.4	56.5	51.4	50.2
	21:00 - 22:00	52.7	48.2	52.1	49.7	48.8	48.0
	22:00 - 23:00	44.9	42.9	45.6	43.5	45.7	43.3
	23:00 - 00:00	43.7	43.1	43.8	44.2	45.6	44.3
	00:00 - 01:00	44.3	43.0	43.5	44.5	43.7	43.2
	01:00 - 02:00	41.3	43.7	42.9	44.5	42.3	43.9
	02:00 - 03:00	45.2	42.9	40.4	42.8	45.1	44.9
	03:00 - 04:00	45.7	42.1	43.1	40.9	43.8	42.3
	04:00 - 05:00	42.2	43.5	41.8	42.0	44.6	40.7
	05:00 - 06:00	43.0	43.1	42.1	43.6	43.4	43.2
L_{eq} Day		50.9	49.8	52.8	52.1	52.1	49.0
L_{eq} Night		44.0	43.1	43.1	43.4	44.4	43.4
L_{DN}		52.2	51.2	52.9	52.6	53.0	51.0

Note: All Values in dB(A)

Result

LOCATION		Panch Padra					
DATE		06.01.2022	20.01.2022	04.02.2022	18.02.2022	04.03.2022	26.03.2022
Hourly L_{eq}	06:00 - 07:00	47.3	47.7	46.5	48.6	48.4	49.3
	07:00 - 08:00	49.2	53.9	40.1	51.2	53.4	48.9
	08:00 - 09:00	49.6	49.4	44.8	46.9	50.8	49.8
	09:00 - 10:00	47.7	47.0	32.7	50.3	52.2	38.6
	10:00 - 11:00	47.2	43.0	27.3	44.1	50.7	54.6
	11:00 - 12:00	47.0	44.8	36.5	45.5	51.5	53.0
	12:00 - 13:00	44.2	35.0	43.4	45.6	52.5	53.4
	13:00 - 14:00	47.3	51.0	41.9	48.7	49.6	52.8
	14:00 - 15:00	41.4	41.9	36.9	43.3	51.6	54.4
	15:00 - 16:00	29.9	44.7	0.0	46.3	50.6	53.7
	16:00 - 17:00	37.8	49.8	36.3	47.7	50.7	47.9
	17:00 - 18:00	41.2	45.6	30.7	48.2	53.0	42.5
	18:00 - 19:00	46.1	43.4	39.0	48.6	55.0	43.1
	19:00 - 20:00	39.9	45.8	41.6	46.2	50.5	48.1
	20:00 - 21:00	48.8	45.3	40.3	46.6	53.6	52.0
	21:00 - 22:00	43.9	48.5	42.3	48.6	51.5	49.0
	22:00 - 23:00	45.1	45.5	43.2	45.9	47.9	46.0
	23:00 - 00:00	45.3	42.3	42.5	43.2	42.4	42.0
	00:00 - 01:00	43.1	45.1	43.8	43.0	44.3	43.5
	01:00 - 02:00	40.8	42.7	43.1	43.2	44.1	42.3
	02:00 - 03:00	42.8	45.1	41.6	42.6	40.2	39.7
	03:00 - 04:00	43.4	43.2	46.0	40.8	43.9	39.8
	04:00 - 05:00	43.1	41.9	42.1	43.5	44.5	44.2
	05:00 - 06:00	46.0	45.2	46.7	44.3	43.7	42.9
L_{eq} Day		46.1	47.8	40.7	47.8	51.9	51.1
L_{eq} Night		44.0	44.1	44.0	43.5	44.4	43.0
L_{DN}		50.4	51.0	49.6	50.6	52.9	51.8

Note: All Values in dB(A)